"Science Questions to be Addressed in the Delta Vision Process"

As Developed by Participants in the April 3, 2007 Evening Work Session of the Stakeholder Coordination Group (SCG)

Top Five Science Questions

1. **What are the features defining a healthy terrestrial and aquatic ecosystem (e.g., food webs, resilient populations, species composition)?**
   [What mix of biological resources constitutes a desired endpoint for a managed Delta ecosystem?]
   [To what extent do upstream processes improve or harm Delta health including support of migratory bird species?]
   [What major ecological landforms do we need, and in what quantities, to maintain a healthy Delta ecosystem (freshwater marsh, tidal marsh, riparian and upland habitat, etc)?]

2. **What are the scientific certainties and uncertainties associated with water conveyance through the Delta, dual facility and/or an isolated facility under a variety of hydrological conditions including drought and water quality, ecosystem and operating rules?**
   [What can the various water conveyance options achieve?]

3. **What are the scientific and/or technical bases for determining the threats to and sustainability of specific islands?**
   [What are the threats of drivers to cost and sustainability of protecting current and potential future land use at given levels of failure/risk?]
   [What is required to maintain the Delta's towns, economy and key infrastructure (roads, rail lines, transmission facilities, gas facilities, etc.)?]

4. **What is the effect of various flow regimes on various Delta values including water quality, habitat, ecosystem, levees, Delta agriculture and water supply?**

5. **What flow regimes under a variety of conditions are needed for a healthy and sustainable Bay-Delta Estuary webs)?**
   [What flexibility can or should be incorporated into water operations (e.g., upstream reservoir releases, pumping levels under different flow regimes, downstream storage) to best address ecosystem health and supply reliability?]
   [What is the impact or usefulness of additional storage, both surface and groundwater, and/or water conservation on this flexibility?]
   [Through aggressive investment in a full range of water management alternatives (e.g. conservation, reclamation, land retirement, transfers, urban storm water management, desalination, etc), what is the maximum level of achievable reductions in Delta diversions?]
   [What is the range of water management alternatives upstream, in-Delta and downstream?]

Remaining Science Questions of Importance to SCG

6. What are implications of climate change on the Delta ecosystem?

[Can the ecosystem adapt to change or are we preventing natural adaptation?]

7. What are the primary causes of pelagic organism decline? What are the cause and effect relationships? What are the solutions?

8. What are the potential impacts and benefits of fluctuating salinity on the Delta?

[What is meant by "fluctuating salinity," including duration and frequency on a temporal and spatial scale?]

[What data can we use to assess the efficacy of managing salinities for desired ecological benefits including measuring salinity on a temporal and special scale?]

[The Delta is already highly invaded by non-native species. What are the affects of fluctuating salinity on native and existing non-native species, and the introduction of new non-native species?]

9. What habitats, agricultural lands, flood plains or other areas should be protected to minimize flood risks in the Delta and Suisun Marsh (e.g. creating a South Delta floodway)?

[What flood control, ecological, and agricultural benefits could be achieved?]

[What lands in or upstream from the Delta have flood attenuation or mitigation value?]

10. What are the likely long term cumulative impacts of existing urbanization patterns and trends considering climate change (e.g. flood risks to central Delta islands, flood risks to residents in existing Delta communities, ecosystem impacts, water quality impacts, loss of future management options)?

11. What are the health risks and implications to treatment associated with the use of Delta water for consumptive purposes, and do these vary with the location of the water supply outtake?

12. What is the effect of discharges in the Delta, as well as upstream, on Delta water quality?